

TEMPEST X01



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MULTI-CHANNEL INSTRUMENTATION

The TEMPEST X01 Flaw Detector offers the very best in Eddy Current Performance

with rotary inspection C-Scan capabilities as standard.

- Advanced features including Conductivity, Auto-Mix, Loop, Guides & Trace.
- Lightweight, ergonomic, rugged design.
- Thumbwheel option for rapid menu navigation.
- Toughened, anti-glare, crisp, daylight readable display, with screen protector.
- Designed to meet IP64, IP68 rated connectors.
- Over 7 hours battery life, fast 2.5 hrs charging time.
- Industry standard probe connectors

The TEMPEST X01 offers improved mechanical and ergonomic design delivering the best in Eddy Current performance, with rotary inspection capabilities as standard, together with variety of advanced features. Based on operator feedback and embracing the use of new materials, the TEMPEST X01 delivers to the end-user enhanced ruggedness, a toughened screen, improved connector access and performance, combined with optional features such as an encoder wheel.

NDT Equipment
For Aero Space



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WIDE FREQUENCY RANGE

The single frequency TEMPEST X01 has a single frequency and dual frequency range of 10Hz to 20MHz, ensuring a diverse range of real world applications can be met.

Area of Inspection: Fasteners
Probe: Low Frequency, Slider

INDUSTRY STANDARD PROBE CONNECTORS

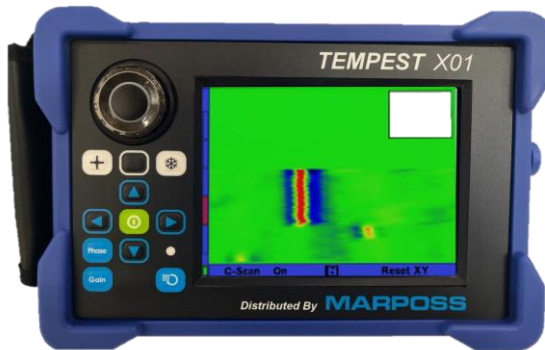
The TEMPEST X01 series uses a wide range of eddy current probes meeting all the needs of the aerospace eddy current inspector. Absolute, Bridge and Reflection connected probes can use the industry standard 12 Way LEMO Connector. A LEMO 00 Connector is also provided for simpler connection of Absolute probes.

Engine Blades & Discs
Probes: High Frequency

Engine Mounts
Probes: High Frequency
Horizontal Stabilisers
Probes: High & Low Frequency

Wings, Surface
Hinges, Window
Frames
Probes: High & Low Frequency, Rotary

Wheels, Wheel
Brakes, Landing Gear
Probes: High Frequency & Rotary



C-Scan representation

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LIGHTWEIGHT, RUGGED, “SURE GRIP” & ENHANCED PROTECTION

TEMPEST X01 weighs just 1.15kg (2.54lbs) and has a blended polymer case, withstanding high levels of impact, oil exposure and UV resistance.

Over-moulded rubber gives the end-user improved handling of the instrument and enhanced grip, with or without gloves. Ergonomic handling is embodied within the case design and at the rear, moulded “bars” offer a more comfortable grip of the unit during long periods of use.

DAYLIGHT VISIBLE, CONFIGURABLE COLOUR SCREEN

TEMPEST X01 has a fully daylight readable 14.5cm LCD colour screen, 640 x 480 pixels, ensuring the operator has excellent signal resolution and presentation, no matter the working conditions. The screen has a 2mm thick anti-reflective polycarbonate protector sheet, delivering excellent impact and added UV protection.

- Engine Blades & Discs
- Probes: High Frequency- Engine Mounts
- Probes: High Frequency
- Horizontal Stabilisers
- Probes: High & Low
- Frequency
- Wings, Surface
- Hinges, Window
- Frames
- Probes: High & Low
- Frequency, Rotary.
- Wheels, Wheel
- Brakes, Landing Gear
- Probes: High
- Frequency & Rotary

Lemo 12 pin connector
Connection of differential probes,
rotor and electrical conductivity

Absolute probe connector

VGA output for external monitor

Micro SD memory card

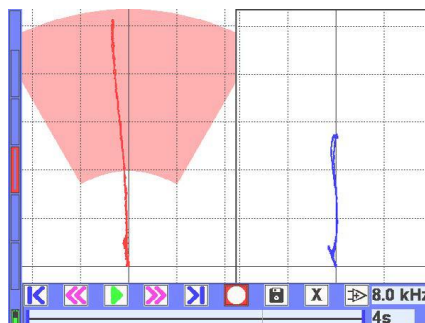
Micro USB
Connection
to Computer



RECORD AND REPLAY

Up to 164 seconds of live data may be recorded in real-time and then played back either on the instrument or on a PC using the desktop application ETHERMap for subsequent analysis and review.

The recorded data may be further optimised by adjusting many settings including Phase, Gain, Filters, Display and Spot position.



EASY TO USE MENUS & ICON SYSTEM

The AeroCheck series menu system is simple and fast to navigate with the ability to add individually selectable soft key menu items to the sidebar as recognisable icons for rapid function access and a “quick-setting menu” for easy set-up, review and adjustment.

With four operator-selectable soft keys and a fifth slot for the last menu function used, Technicians can quickly modify the system with their preferences.

Each saved instrument setting can be associated with a unique, single press set of quick access soft keys.

There are also two front panel hard keys that can be readily programmed for rapid single press access to frequently used functions.

<div>27 Feb 13:08:23</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>	Eddy current Probe Gain 1 Gain 2 Filters Rotary Mix Summary	Configure Appearance Power save Time & Date Load & Save About.. Lock
	Display Graticule Spot Offset Persistence Panes	Advanced Alarm Alarm Zone Attachments Guides Record & Replay Auto Phase

Summary			
- CH1 -		- Alarm -	
Phase	6.0	Source	1st
Gain X	44.0 dB	Action	500ms
Gain Y	44.0 dB	Stretch	Off
Gain Lock:	Y=X	Type	Off
Input gain:	12 dB	- Offset -	
High Pass	DC	P1 X	-10 %
Low Pass	300	P1 Y	-35 %
		P2 X	0 %
		P2 Y	-35 %

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ROTARY C-SCAN CAPABILITIES AS STANDARD

The TEMPEST X01 includes rotary capabilities as standard and can be used with the ETHER Mercury (mini) ARD002, Hocking 33A100 or the Rohmann MR3/SR1 and SR2 Drives (with special adapter cable). The new high resolution C-Scan feature gives an image of the inner diameter hole inspection.

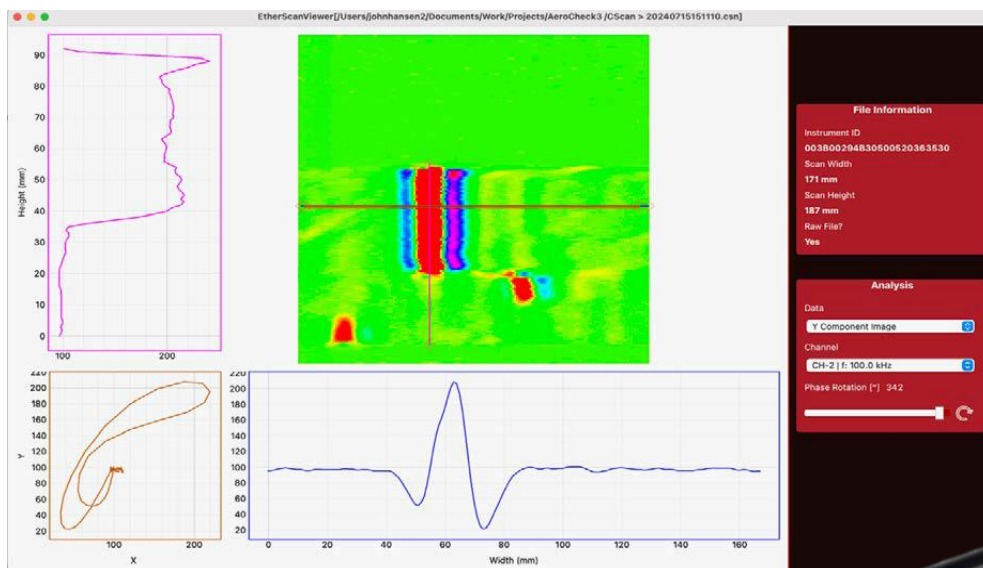
This image allows the individual layers in an inspected hole to be visualised.

The data collected can be stored as a full data array with up to two frequencies.

Further analysis both on the instrument and offline on a desktop PC is possible.

Stored data may then be further analysed and optimised with the Gain and Phase being fully adjustable post-test to significantly increase the probability of detection and improve data interpretation.

Up to 10,000 scans may be stored on the 32GB SD card.



Roto Scanner



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ADVANCED FEATURES

Trace Feature

The trace function allows a reference trace to be stored on the screen and appears along with the graticule behind the live spot, allowing the operator to readily compare the live data with the reference calibration.

Guides Feature

Guides" allows the user to display a slide show that can be created easily with commonly used desktop software. The benefit of this feature is that instructions, tutorials and procedures for an inspection can be added to the TEMPEST very quickly and the NDT inspector can easily switch between the inspection itself and the "Guides" while performing a live test.

Loop Feature

Loop is a convenient way of capturing a short live repetitive signal and then optimizing the instrument settings through real time adjustments of the Phase, Gain, Balance, Filters and Display Configuration in order to simplify the task of optimising the parameters.

The Loop function is excellent for calibration set-up especially for setting a Dual Frequency mix

Dual Frequency / Channel Feature:

At different frequencies, different signal indications (e.g. lift off and defect) have a different relative phase and amplitude response. By means of Phase Rotation and Gain change of the X Y signal components one of these indications can be manipulated to be almost identical in phase and amplitude as the other and then by subtraction (mixing), the unwanted component is minimised, giving an improved detection of the required signal.

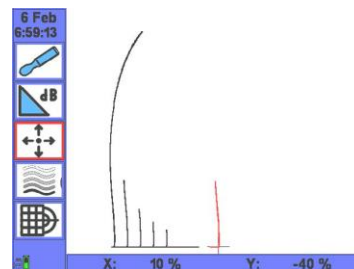
Auto-Mix Feature

A dual frequency mix exploits the phase and sensitivity change between two different types of indication to suppress one and enhance the other.

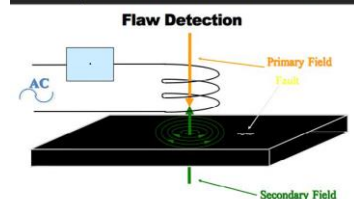
Auto-mix simplifies the sometimes complex procedure of mixing two different frequency signals and can be achieved on the TEMPEST through a series of easy steps. Once set up, the Auto-Mix itself is as simple as pressing one key.

Conductivity Measurement

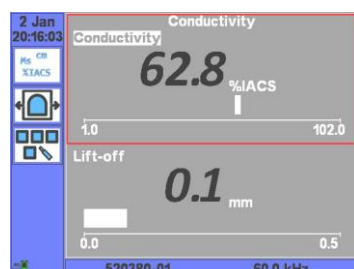
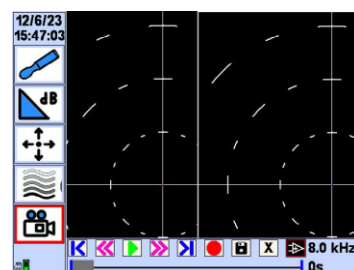
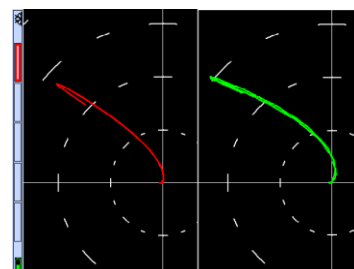
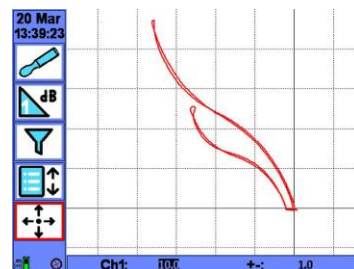
Many aerospace procedures require that Conductivity Measurement is available on the designated Eddy Current Flaw Detector. When connecting the Conductivity Probe, the TEMPEST auto-detects the probe and seamlessly switches into conductivity mode. Removal of the probe switches the instrument back to flaw detection mode. The Conductivity Measurement Option is available through the purchase of the KACON001 KIT, with no software fee.



Impedance Plane Flaw Detector



ETHER NDE 3s ethands.com





TEMPEST X01 Specification				
Probe	Connectors	12-Way Lemo 2B (IP68) (Absolute, Bridge and Reflection) and Connection Lemo 00 (IP68) (for single element absolute probes). Simultaneous probe operation possible using Lemo 12-Way and Lemo 00.		
	Rotary Drive	600-3000 rpm - ETHER Mercury Drive (ADR002), Hocking 33A100, Rohmann MR3, SR1 & SR2 Drive (special adapter needed)		
	Conductivity	Option becomes active with use of an AeroCheck Conductivity probe and cable (see end of spec table)		
Frequency	Single/Dual	Single	Dual	10Hz - 20MHz
Gain	Overall	-18 to + 104 dB, 0.1, 1 and 6dB steps (104dB maximum) + Mix Gain (-18 to +18dB on Output)		
	Input	0dB or 12dB		
	Drive	- 6dB to 10dB in 1dB steps (0dB reference 1mW into 50 ohm)		
	Max X/Y Ratio	+/-100.0dB		
Phase	Range	0.0-359.9°, 0.1° steps		
	Auto Phase	Allows phase angle to be automatically set to a pre-set angle		
Filters	Normal High Pass	DC to 2kHz or Low Pass Filter, whichever is the lower in 1 Hz steps. Plus variable adaptive balance drift compensation 0.01 - 0.5 Hz (6 steps)		
	Normal Low Pass	1Hz to 2kHz or a quarter of the lowest test frequency, whichever is lower in 1 Hz steps		
Balance	Manual	14 internal balance loads; 2.2µH, 5.0µH, 6.0µH, 6.5µH, 7.0µH, 7.5µH, 8.2µH, 12µH, 15µH, 18µH, 22µH, 30µH, 47µH, 82µH		
	Automatic	Optimised balance load selection		
Alarms	Box & Sector	Both Alarm types are fully configurable, Freeze, Tone or Visual		
	Output	Open collector transistor (50v dc at 10mA max) available on 12-way Lemo		
Display	Type	145mm (5.7"), 18 bit Colour, daylight readable		
	Viewable Area	115.2mm (4.53") (Horizontal) x 86.4mm (3.4") (Vertical)		
	Resolution	640 x 480 pixels		
	Colour Schemes	User configurable Dark, Bright and Black & White		
	Configurable Screen	Full Screen, Single, Dual Spot or Dual Pane with variable size and location and function e.g. XY, Time- base, Waterfall and Meter.		
	Display Modes	Full Screen, Single, Dual Spot or Dual Pane with variable size and location and function e.g. XY, Time- base, Waterfall and Meter. Spot, Time base (0.1-20 seconds x 1-200 sweeps and up to 55 seconds), Waterfall and Meter with peak hold and % readout		
	Graticules	None, Grid (4 sizes 5, 10, 15 and 20% FSH), Polar (4 sizes 5, 10, 15 and 20% FSH)		
	Offset	Spot Position: Y =-50 to +50, X =-65 to +65%		
	Digital Spot	Display in X, Y or R,θ		
	Setting	Display/Edit of all settings in Legacy Format		
Removable Storage data	Setup Storage	micro SD up to 32GB, holding over 10,000 settings		
	Stored Screen Shots	micro SD up to 32GB, holding over 10,000 screen shots		
	Shots	Comprehensive Record, Replay and Storage		
	Record Replay	Real-time recording of trace data and Replay on instruments and desktop PC up to 164 seconds		
Outputs	PC Connectivity	USB (Full PC remote control plus Real Time data)		
	Digital Volt Free Alarm	On Lemo 12-way Open collector transistor (36v dc at 10mA max)		
	VGA	Full 15 way VGA output		
Languages		English, French, Spanish, Italian, Portuguese, Russian, Japanese, Chinese, Turkish, Czech, Norwegian.		
Verification Level		The system includes on delivery a 2 year validity Verification Level 2 detailed functional Check and calibration, as per ISO 15548-1:2013.		
Power On Self Test		A "self test" on start-up is performed of external ram, accelerometer, Micro SD card, LCD screen buffer.		
Power	Battery	Internal 7.2V nominal @ 3100mAh = 22.32 watt.hr		
	Running Time	Over 7 hours with a 2MHz Pencil Probe and 50% backlight		
	Charging Time	2.5 hrs. charge time, simultaneous charge and operation		
	External	100-240v 50-60Hz 30 Watts		
	Connector	Lemo OS Hermaphroditic keying, half-moon insert (IP68)		
Physical	Weight	1.15 kg (2.54 lbs)		
	Size (w x h x d)	222.2mm x 152.2mm x 47.4mm (LxHxW) (8.75" x 6.0" x 1.87")		
	Material	Main Body: PC-ABS a blend of the two polymers - Polycarbonate (PC) and Acrylonitrile Butadiene Styrene (ABS). Over-moulded Material: TPE Red Rubber, Thermoplastic Elastomer (TPE).		
	Operating Temp.	-20 to +60°C (-4 to 140 °F)		
	Storage Temp.	Storage for up to 12 months -20 to +35°C (-4 to 95°F) Nominal +20°C (68°F)		
	IP Rating	Designed to meet requirements of IP64		



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Quick Reference Card **TEMPEST X01**

Document: xxxxx
Issue: 1
Date: 25/04/2025

Thumbwheel:

- Short Press – OK/Select
- Long Press – Back
- Rotate Clockwise/Anticlockwise – Direction/Select & Cursor
- White LED Illuminated – Alarm Window Broken / Flashes On During Instrument Powering On

Customer Configurable Button

Short Press – Selects Customers Choice of Button Type

- Long Press – Brings up button selection box

- None
- Clear Screen
- Clear Pane 1
- Clear Pane 2
- Screen Shot
- Auto Phase
- Balance Load
- Screen Flip
- Loop
- Trace

- Short Press – Balance
- Long Press – Auto Phase

Direction Keys/Select & Cursor

- Short Press – OK/Select
- Long Press – Power ON/OFF

- Short Press – Freeze
- Long Press – Clear & Balance



Daylight Visible
Colour Display

Power/Charging Indicator

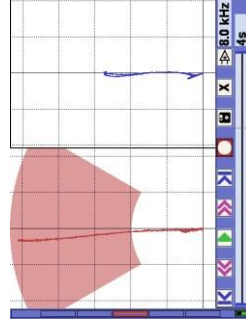
- Green – Fully Charged
- Red – External Supply Plugged in and Charging

Gain

- Short Press – Phase
- Long Press – Auto Phase

- Menu/Back

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Camera Mount

Record and Replay